

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Fiala, et al.

Serial No.: Unassigned

Filed: Herewith

For: SILICON-DOPED AMORPHOUS CARBON COATING  
FOR PAINT BELL ATOMIZERS

Attorney Docket No.: FGT 1622 PA

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Angie Moscowitz

  
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Signature

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to the examination of the above-identified divisional application, please enter the following amendment.

**In The Specification:**

On page 1, before the first heading entitled "Technical Field," please add the following heading and paragraph:

**CROSS-REFERENCE TO RELATED APPLICATIONS**

This is a divisional of United States Patent Application  
Serial No. 09/552,132 filed on April 19, 2000.

Please amend the second full paragraph on page 12 to read as follows:

While the invention has been described in terms of preferred embodiments, it will be understood, of course, that the invention is not limited thereto since modifications may be made by those skilled in the art, particularly in light of the foregoing teachings. For example, the silicon-doped amorphous coating may be used to improve the wear resistance on the wear surfaces of a wide variety of spray application equipment other than rotary paint atomizers, including, for example, compressed air spray guns.

PENDING PAPER

**In The Claims:**

Please withdraw claims 1-7.

Please add new claims 25-34 to read as follows:

25. (New) A method for improving wear resistance of the outer spraying surface of spray application equipment, the method comprising the steps of:

preparing the outer spraying surface of the spray application equipment;

applying a wear resistant coating to said outer spraying surface.

26. (New) The method according to claim 25, wherein the step of preparing the outer spraying surface of the spray application equipment comprises the steps of:

cleaning said outer spraying surface;

etching said outer spraying surface;

rinsing said outer spraying surface;

drying said outer spraying surface; and

atomically cleaning said outer spraying surface.

27. (New) The method according to claim 26, wherein the step of cleaning said outer spraying surface comprises the steps of:

cleaning said outer spraying surface with a soap solution;  
cleaning said outer spraying surface with water; and  
cleaning said outer spraying surface with solvent.

28. (New) The method according to claim 26, wherein the step of etching said outer spraying surface comprises the steps of:

etching said outer spraying surface with a 5% solution of sodium hydroxide for a predetermined time;  
rinsing said outer spraying surface with water; and  
etching said outer spraying surface with a 1% nitric acid solution for a second predetermined time under ultrasonic agitation.

29. (New) The method according to claim 26, wherein the step of drying said outer spraying surface comprises the step of:

blow drying said outer spraying surface with air; and  
placing the spray application equipment in a vacuum pressure chamber for a predetermined time at a predetermined pressure.

30. (New) The method according to claim 26, wherein the step of atomically cleaning said outer spraying surface comprises the steps of:

atomically cleaning said outer spraying surface by argon bombardment at 200 volts;  
atomically cleaning said outer spraying surface by argon bombardment at 500 volts; and

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atomically cleaning said outer spraying surface by argon bombardment at 200 volts.

31. (New) The method according to claim 25, wherein the step of applying a wear resistant coating to said outer spraying surface comprises the steps of:

placing the spray application equipment in a chamber containing a power source and a gaseous mixture of hydrocarbons and silicon-doped hydrocarbons;

applying a predetermined frequency and voltage bias from said power source for a predetermined time to coat the spray application equipment to a predetermined film thickness at a predetermined silicon composition.

32. (New) The method according to claim 31, wherein the step of placing the spray application equipment in a chamber containing a power source and a gaseous mixture of hydrocarbons and silicon-doped hydrocarbons comprises the step of:

placing the spray application equipment in a chamber containing a power source and a gaseous mixture of methane and tetramethylsilane.

33. (New) The method of claim 25 further comprising the step of applying an adhesion promoter to said outer spraying surface of the spray application equipment prior to the step of applying a wear resistant coating to said outer spraying surface.

34. (New) The method according to claim 25, wherein the step of applying an adhesion promoter coating to said outer spraying surface comprises the step of sputtering a layer of chrome on said outer spraying surface to a predetermined thickness.

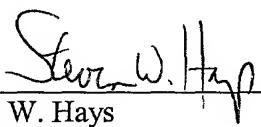
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**REMARKS**

This Preliminary Amendment is being filed together with a divisional application. Claims 8-24 currently pending in the present application are being retained with claims 1-7 being canceled. Applicants have also added new claims 25-34 for examination.

Respectfully submitted,

**ARTZ & ARTZ, P.C.**

  
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Date: January 25, 2002

1622PA-11-02

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

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On page 1, before the first heading entitled "Technical Field," please add the following heading and paragraph:

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Please amend the second full paragraph on page 12 as follows:

While the invention has been described in terms of preferred embodiments, it will be understood, of course, that the invention is not limited thereto since modifications may be made by those skilled in the art, particularly in light of the foregoing teachings. For example, the silicon-doped amorphous coating may be used to improve the wear resistance on the wear surfaces of a wide variety of spray application equipment other than rotary paint atomizers, including, for example, compressed air spray guns.

**In The Claims:**

Please withdraw claims 1-7.

Please add new claims 25-34 as follows:

25. (New) A method for improving wear resistance of the outer spraying surface of spray application equipment, the method comprising the steps of:  
preparing the outer spraying surface of the spray application equipment;

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applying a wear resistant coating to said outer spraying surface.

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29. (New) The method according to claim 26,  
wherein the step of drying said outer spraying surface  
comprises the step of:

blow drying said outer spraying surface with air; and  
placing the spray application equipment in a vacuum  
pressure chamber for a predetermined time at a  
predetermined pressure.

30. (New) The method according to claim 26,  
wherein the step of atomically cleaning said outer spraying  
surface comprises the steps of:

atomically cleaning said outer spraying surface by  
argon bombardment at 200 volts;  
atomically cleaning said outer spraying surface by  
argon bombardment at 500 volts; and  
atomically cleaning said outer spraying surface by  
argon bombardment at 200 volts.

31. (New) The method according to claim 25,  
wherein the step of applying a wear resistant coating to said  
outer spraying surface comprises the steps of:

placing the spray application equipment in a chamber  
containing a power source and a gaseous mixture of  
hydrocarbons and silicon-doped hydrocarbons;  
applying a predetermined frequency and voltage bias  
from said power source for a predetermined time to coat the  
spray application equipment to a predetermined film thickness  
at a predetermined silicon composition.

32. (New) The method according to claim 31,  
wherein the step of placing the spray application equipment in  
a chamber containing a power source and a gaseous mixture of

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hydrocarbons and silicon-doped hydrocarbons comprises the step of:

placing the spray application equipment in a chamber containing a power source and a gaseous mixture of methane and tetramethylsilane.

33. (New) The method of claim 25 further comprising the step of applying an adhesion promoter to said outer spraying surface of the spray application equipment prior to the step of applying a wear resistant coating to said outer spraying surface.

34. (New) The method according to claim 25, wherein the step of applying an adhesion promoter coating to said outer spraying surface comprises the step of sputtering a layer of chrome on said outer spraying surface to a predetermined thickness.

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